

REMARKS

Claims 1-34 are previously canceled. Claims 35-52 were pending in the present application. Claims 35-49 are rejected under 35 U.S.C. §112. Claims 35-52 are rejected under 35 U.S.C. §103(a). Claim 42 is amended, and claim 44 is canceled. No new matter has been added. Claims 35-43, and 45-52 are pending.

Support for Claim 42

Claim 42 as amended includes the limitation “wherein said sharp edge portion directing the fuel exiting the combustion bowl in a direction parallel with said centerline.” An Office Action dated July 14, 2005 rejected a similar limitation as new matter, stating: “Newly insert[ed] limitation of ‘the sidewall portion extending **parallel** to the centerline ...’ is a new matter since the specification disclosed [this element] as **substantially parallel** (page 8, lines 4-5).” (Emphasis in the original). Applicant respectfully disagrees.

The MPEP states, “[m]atter not in the original specification, claims, or drawings is usually new matter.” MPEP, 608.04(a). Further, “[i]n establishing a disclosure, applicant may rely not only on the description *and drawing as filed* but also on the original claims if their content justifies it.” MPEP, 608.04(l), emphasis added. In the present instance, the specification includes the description “substantially parallel” at page 8, lines 4-5 as described in the July 2005 Office Action. Further, Figure 4 illustrates an embodiment wherein the sidewall portion is in fact parallel with the centerline. One of skill in the art would have understood the description of substantially parallel, combined with a Figure showing actual parallelism, to include a parallel sidewall portion as one embodiment of the present invention. Therefore, the subject matter of claim 42 as amended is illustrated in Figure 4.

Response to Claim Rejections

Rejections under 35 U.S.C. §112

Claims 35-49 stand rejected under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The present Office Action (hereinafter, *Action*) states “[t]he use of the words ‘substantially’ is vague and indefinite.” The Action has not stated a complete rejection under the MPEP 706.03(d), ¶7.30.01, which states: “Whenever possible, identify the particular term(s) or limitation(s) which render the claim(s) indefinite and *state why such term or limitation renders the claim indefinite*. If the scope of the claimed subject matter can be determined by one having ordinary skill in the art, a rejection using this form paragraph would not be appropriate.”

The use of substantially is not per se indefinite – for example, a search on November 6, 2007 indicates that 885,987 issued patents between 1976 to the present include a claim with “substantially” – and the Applicant submits that one of skill in the art would understand the scope of the claims with regard to each usage of substantially in the cited claims. The *Action* does not indicate why the terms as utilized in this context render the claims indefinite.

Further, the Patent Office has accepted the present form of the claims, with respect to 35 U.S.C. §112, on numerous previous occasions. While it is permissible for the Patent Office to raise the issue even after multiple previous opportunities to do so, it is not the preferred practice as described in MPEP 707.07(g). It is puzzling to the Applicants why the Patent Office would not immediately present such a rejection, and would indeed require inclusion of “substantially” at several points throughout the prosecution (see, e.g. Office Action mailed July 14, 2005, at page 2) only to later reject it as indefinite. Applicant respectfully submits that, based on the disclosure and the context of the art, one of skill in the art would understand the scope of the

claims with regard to each usage of substantially in the cited claims. Applicant requests that the rejection of claims 35-49 under 35 U.S.C. §112 be withdrawn.

Rejections under 35 U.S.C. §103(a)

Claims 35-52

Claims 35-52 are rejected under 35 U.S.C. §103(a) as being unpatentable over Gaiser et al. (US 6,539,910, hereinafter *Gaiser*) in view of Hoffman et al. (US 5,605,126, hereinafter *Hoffman*). The seminal case directed to application of 35 U.S.C. § 103 is *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966). From this case, four familiar factual inquiries have resulted. The first three are directed to the evaluation of prior art relative to the claims at issue, and the last is directed to evaluating evidence of secondary considerations. *See*, MPEP §2141. The Supreme Court has recently reaffirmed that *Graham* “continue[s] to define the inquiry that controls.” *KSR v. Teleflex*, 550 U.S. ___, 82 USPQ2d 1385 (2007).

The examiner bears the burden of establishing a prima facie case of obviousness. *See, In re Warner*, 379 F.2d 1011, 1016, 154 USPQ 173 (CCPA 1967), *cert. denied*, 389 U.S. 1057 (1968). To meet this burden, three basic criteria must be met. First, there must be some suggestion or motivation in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *See*, MPEP § 2142, *citing In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

For the following reasons, these criteria have not been met and a prima facie case of obviousness has not been established. First, the asserted sidewall portion from *Gaiser* is not substantially parallel to the centerline. Second, the combination of *Gaiser* with *Hoffman* renders the apparatus of *Gaiser* inoperative, and thereby does not have a reasonable expectation of success. Third, claim 42 includes the limitation “parallel” for the sidewall portion, and *Gaiser* does not disclose a sidewall portion that is parallel to the centerline. These reasons are discussed in further detail below.

Claim 35, 42

Claim 35 includes the limitation “a part of said sidewall portion extending substantially parallel to the centerline.” Claim 42 as amended includes a similar limitation. The Action asserts that *Gaiser* discloses “a combustion bowl is defined by a circumferential sidewall [that is] substantially parallel to the centerline.” Applicant respectfully disagrees.

The present application includes three specific examples of the sidewall in Figures 2-4.¹ Figure 2 illustrates a sidewall portion that is 2 degrees off of vertical (i.e. the centerline). Figure 3 illustrates a sidewall portion that is 2 degrees off of vertical. Figure 4 illustrates a sidewall portion that is zero degrees off of vertical. By contrast, the sidewall (reference unavailable as the sidewall in *Gaiser* is not numbered or described) in *Gaiser* as illustrated in Figure 4 is 12 degrees off of vertical. The other figures in *Gaiser* do not illustrate an element that can be compared to a sidewall of the present invention. Therefore, the angle of the element asserted to be a sidewall from *Gaiser* is six times greater than the largest angle from illustrated embodiments of the present invention. In the precise art of piston bowl machining, one of skill in the art would not

consider 12 degrees off the vertical to be “substantially parallel” and would understand that angles almost one order of magnitude greater than the illustrated embodiments were not contemplated within the scope of the present application. Therefore, *Gaiser* does not disclose the element “a part of said sidewall portion extending substantially parallel to the centerline” as required in claim 35.

Because *Gaiser* in combination with *Hoffman* does not disclose each element of claim 35, the rejection under 35 U.S.C. 103(a) is improper. Applicant respectfully requests that the rejection of claim 35 be withdrawn and submits that claim 35 is in a condition for allowance. Because claims 36-41 include all limitations of claim 35, claims 36-41 are also in a condition for allowance. Claim 42 as amended is also in a condition for allowance for similar reasons to those described under claim 35 preceding. Similarly, claims 43 and 45-49 include all limitations of claim 42 and are in a condition for allowance. Therefore, Applicants respectfully request the prompt allowance of claims 35-43 and 45-49.

Claims 35, 49, 50

Claim 35 includes the limitation “a piston having a solid head.” Claims 49 and 50 each include a similar limitation. The Action asserts that while “[*Gaiser*] does not show the use of a solid head portion of a piston”, “*Hoffmann* shows that the provision of a solid piston head is old and well known in the art.” Applicants respectfully assert that the combination of *Gaiser* with *Hoffmann* is improper and requests that the rejection of claims 35, 49, and 50 under 35 U.S.C. §103(a) be withdrawn.

¹ For consistency, all angle determinations in this discussion were made by projecting a line overlaying the sidewall portion; the right-hand sidewall was used for each Figure.

Gaiser is directed to a “Closed gallery piston having con rod lubrication.” *Gaiser*, title. Each embodiment of *Gaiser* includes the oil gallery 42. *Gaiser*, abstract, summary, each paragraph of the detailed description, and claim 1. Indeed, an embodiment of *Gaiser* with a solid piston head would be inoperable. For a combination of references to be proper, there must be a reasonable expectation of success. See Graham, preceding, factor two. The Action has failed to indicate why one of skill in the art would create the connecting rod lubrication apparatus of *Gaiser* with a solid piston head that had no oil gallery 42 to provide oil to the connecting rod. Therefore, Applicant respectfully asserts that the Action has failed to establish a prima facie case of obviousness, and requests that the rejection of claim 35 under 35 U.S.C. §103(a) be withdrawn.

Because *Gaiser* combined with *Hoffman* does not have a reasonable expectation of success, the rejection of claim 35 under 35 U.S.C. 103(a) is improper. Applicant respectfully requests that the rejection of claim 35 be withdrawn and submits that claim 35 is in a condition for allowance. Because claims 36-41 include all limitations of claim 35, claims 36-41 are also in a condition for prompt allowance. Claims 49 and 50 are also in a condition for allowance for similar reasons to those described under claim 35 preceding. Similarly, claims 51 and 52 include all limitations of claim 50 and are in a condition for prompt allowance. Therefore, Applicants respectfully request the prompt allowance of claims 35-41 and 49-52.

Claim 42

Claim 42 as amended includes the limitation “wherein said sharp edge portion is defined on a part of a wall of the combustion bowl extending in a direction parallel with said centerline.” *Gaiser* in combination with *Hoffman* does not include a sidewall having a sharp edge portion

with this structure. The sidewall structure described is a sidewall parallel to the centerline, while the sidewall illustrated in *Gaiser* is 12 degrees off of the centerline. Therefore, *Gaiser* in combination with *Hoffman* does not disclose each limitation of claim 42 as amended, and the rejection under 35 U.S.C. § 103(a) is therefore improper. Applicant respectfully requests allowance of claim 42 as amended. Claims 43-49 each include all limitations of claim 42 as amended, and the Applicant therefore requests prompt allowance of claims 43-49.

Applicant believes that all of the present pending claims of the application are allowable and respectfully requests the Examiner to issue a Notice of Allowance for this application indicating the same. In the event a telephone conversation would help expedite the prosecution of this application, the Examiner may reach the undersigned at (317) 238-6268.

Respectfully Submitted:

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